REMARKS/ARGUMENT

Claims 3-34, 39, 40, 43-45, 48-50, 53-57, 60-64, 67-70, 73-78, 81-84, 87-92 and 95-98 are pending. Claims 3, 6, 9, 13, 17, 20, 24, 27, 31, 39, 44, 49, 56, 63, 69, 77, 83 and 91 are the independent claims.

Claims 3, 4, 6, 7, 9, 10, 11, 13-15, 17, 18, 20-22, 24, 25, 27-29, 31-33, 39, 40, 44, 45, 49, 50, 56, 57, 63, 64, 69, 70, 77, 83, 84, 91 and 92 were rejected under 35 U.S.C. § 103(a) over U.S. Patent 5,790,574 ("Rieger '574") in view of U.S. Patent 6,339,604 ("Smart '604") U.S. Patent 6,281,471 ("Smart '471"). Claims 5, 8, 12, 16, 19, 23, 26, 30 and 34 were rejected under 35 U.S.C. § 103 as obvious from Rieger '574 in view of Smart '604 and Smart '471 and further in view of U.S. Patent 6,404,787 (Unternahrer et al.). Claims 43, 48, 53, 60, 67, 73, 81, 87 and 95 were rejected under 35 U.S.C. § 103 as obvious from Rieger '574 in view of Smart '604 and Smart '471 and Unternahrer et al. and further in view of U.S. Patent 5,710,787 (Amada et al.). Claims 54, 55, 61, 62, 74, 75, 88, 89, 96 and 97 were rejected under 35 U.S.C. § 103 as obvious from Rieger '574 in view of Smart '604 and Smart '471 and Amada et al. Claims 68, 76, 82, 90 and 98 were rejected under 35 U.S.C. § 103 as obvious from Rieger '574 in view of Smart '604 and Smart '471 and further in view of U.S. Patent 5,742,634 ("Rieger '634"). Applicants submit that the independent claims are patentable over the cited art for at least the following reasons.

Claim 3 is directed to a method for repairing a pattern using a laser comprising: identifying a defect in the pattern; slicing a single laser pulse or multi-laser pulses from a string of pulses making up laser light emitted from a Q-switched mode-locked pulse laser by using an optical modulator; and applying the laser light having the sliced single pulse or the sliced multi-laser pulses as laser light to the defect to remove the defect for repair processing.

Among the features of claim 3 not taught or suggested in the prior art is slicing a single laser pulse or multi-laser pulses from a string of pulses making up laser light emitted from a Q-switched mode-locked pulse by using an optical modulator.

The Office Action conceded that Rieger '574 does not teach this recited feature related to pulse slicing. In an attempt to remedy this deficiency, the Office Action proposes a combination of certain teachings of Smart '604 and the Rieger '574 application.

In Rieger '574, a pulse train is generated, either by a laser that already creates a pulse train, such as a Q-switched mode locked laser, or by generating a pulse train from a series of individual pulses from a laser that generates a single pulse, as opposed to a train of pulses. In either case, the individual pulses of the pulse train are passed through an amplification stage so as to have an energy per pulse of about 80mJ per pulse. The beam (pulse train) created out of the amplified pulses is used for X-ray lithography. According to Rieger '574, an advantage of using a Q-switched mode locked laser for the seed laser, aside from the fact that such a laser creates a pulse train, is that the individual pulses of this type of seed laser will be of higher energy and will need less amplification.

Smart '604 controls a laser so that only the primary laser pulse emitted from the laser rod during the emission period impinges on the workpiece, for example in resistor trimming. As shown in Figure 3, in Smart '604, the desired energy per pulse is achieved not by amplification of each short pulse of a pulse train generated by a seed laser, as in Rieger '574, but by changing the repetition rate of the laser. With the lower repetition rate, instead of a single pulse being emitted, a primary pulse is emitted, followed by a series of secondary pulses followed by a CW output. The Smart '604 removes the unwanted secondary and CW output, leaving only the primary pulse, the energy of the primary pulse having been controlled by controlling the repetition rate.

Smart '604 teaches a structure that controls the energy per pulse in a manner entirely differently than Rieger '574. Whereas Rieger uses an amplifier on seed laser pulses to amplify the energy of each pulse, Smart '604 controls, for example, decreases, the repetition rate to achieve a desired primary pulse energy, and removes the unwanted secondary pulses and a CW output.

To establish a prima facie case of obviousness, there must be some motivation that would have caused one of skill in the art to have made the proposed modification. Further, it is improper for the proposed modification to change the principle of operation of the primary reference.

In this case, both Rieger '574 and Smart '604 are intended to achieve the same result, control of the energy per pulse. However, they both go about this in very different ways, as was discussed above. Injecting the method of such control defined by Smart '604 into Rieger '574 would introduce an entirely different way of controlling the energy of each pulse. In fact, this would amount to simply changing the way Rieger '574 works to the way Smart '604 works. It is submitted that their would have been no reason to make such a change, except to attempt to meet the claims in question, which is improper.

For at least this reason, claim 3 is believed patentable over the cited references. The other independent claims each recite a similar feature and are believed patentable for substantially similar reasons.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

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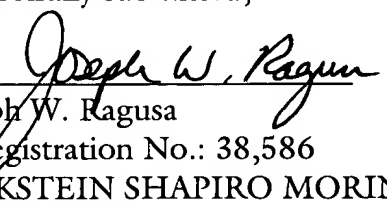
Respectfully submitted,

By 

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